PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A descriptive study of access to services in a random sample of canadian rural emergency departments.
AUTHORS	Fleet, Richard; Poitras, Julien; Maltais-Giguère, Julie; Villa, Julie; Archambault, Patrick

VERSION 1 - REVIEW

REVIEWER	Eddy Lang University of Calgary, Canada The Canadian Emergency Medicine scene is small and I know the investigative team and am familiar with their work. I do not think this has biased my assessment.
REVIEW RETURNED	30-Sep-2013

THE STUDY	This is important and preliminary descriptive work examining potential inequities in access to emergency health care services in rural Canadian settings. The authors make a few assumptions which are not necessarily evident to me. For example is local access to some of these services, necessary, effective and cost-effective? Telehealth has made important in-roads in this area and may have obviated the need for local access in some instances. I am also concerned about the possibility of selection bias in the sampling strategy adopted. For example, hospitals who were well-equipped in terms of imaging or consulting services may have been less interested in participating thus favoring under-resourced facilities. The authors also seem to suggest that transporting patients in some of these settings is problematic and may lead to worse outcomes. This is not necessarily true and could be addressed in more depth by the paper. In some instances it may be an effective alternative if appropriate criteria are established. Finally, the authors don't address the possibility that the population living in rural settings has accepted as a necessary trade-off for living in those settings, the fact that limited access to urban services will always be the case.

REVIEWER	Charles Branas University of Pennsylvania, Philadelphia, USA
REVIEW RETURNED	08-Oct-2013

THE STUDY	In general, this is a well written paper of an important topic.

	In abstract it would be advantageous to say that "…122(36%) were randomly selected and contacted…" In the abstract, "RST" is not defined. The descriptive study objective is laudable although more language could be added in fulfilling the goal stated in the Introduction: "…planning an intervention to address the causes of a lack of access to comprehensive health care in rural Canada." Can you give us some idea(s) as to what this/these intervention(s) might be? The independent random selection procedure by a biostatistician is excellent. Somewhere the Methods should state that the sample is a stratified random sample by province/territory – although the >=25% sample was met for every province/territory (according to Table 1), it might be good to state this in the Methods. It would have been better to use travel time calculations to Level 1 and 2 trauma centers, as opposed to distance calculations. Travel time is a much better metric of patient experience. The paper might mention this and explore this as a limitation of the paper, explaining how the results could have been different had travel time been used as opposed to road distance. Table 2 is of minimal value and the authors might consider removing it and perhaps putting some of the information in the text. The characteristics of the RSTs themselves may be very different than the larger catchment areas where the EDs/hospitals are located. This raises an important question- do Canadian hospital catchment areas/regions exist that could serve as units of analysis? Table 3 needs a better title and would be much enhanced with additional columns detailing the same information for nonrural hospitals to compare to. Table 4 also would benefit from a more precise title.

VERSION 1 – AUTHOR RESPONSE

Reviewer Name Eddy Lang
Institution and Country University of Calgary, Canada
Please state any competing interests or state 'None declared': The Canadian Emergency Medicine scene is small and I know the investigative team and am familiar with their work. I do not think this has biased my assessment.

This is important and preliminary descriptive work examining potential inequities in access to emergency health care services in rural Canadian settings. The authors make a few assumptions which are not necessarily evident to me. For example is local access to some of these services, necessary, effective and cost-effective? Telehealth has made important in-roads in this area and may have obviated the need for local access in some instances.
Response: We agree with Dr Lang, further studies are required to determine the level of minimally acceptable resources necessary to support rural EDs. As mentioned in our conclusion ("ultimately, a study aimed at examining the relationship between the level of service, interfacility transport requirements and patient outcomes is required"), predictive models, including geo-demographic, trauma risk, patient severity, EDs volume, triage level, resource level, interfacility transportation

processes, and outcome factors could be developed to help decision-makers in their resource-allocation planning process. Similar work is being conducted in the field of rural obstetrics.
As for telemedicine, we also agree with Dr Lang that this technology has great potential, especially in helping with clinical decision–making and improving interfacility processes. However, lots of work needs to be carried out before this technology is used as a panacea to the problem of providing quality emergency care in the context of limited resources. For example, telemedicine will not replace the skilled hand of the versatile rural surgeon. However, teleradiology including teleutrasound has great potential. Still, you need to provide the resource.

I am also concerned about the possibility of selection bias in the sampling strategy adopted. For example, hospitals who were well-equipped in terms of imaging or consulting services may have been less interested in participating thus favoring under-resourced facilities.
Response: We added this as a limit in the Limitations section.

The authors also seem to suggest that transporting patients in some of these settings is problematic and may lead to worse outcomes. This is not necessarily true and could be addressed in more depth by the paper. In some instances it may be an effective alternative if appropriate criteria are established.
Response: Data on interfacility transport processes in rural centers is scarce. We simply mentioned, in the Discussion section, that with respect to the great distances from Level 1 and 2 trauma centers , it is unlikely that patients will have timely access to resources in these centers within the “golden hour” or two... The question is, what do you do while you wait the transfer (because you will)? Perhaps, better local diagnostics such as CT scanners, or help from a surgeon combined with improved training of local ED team could assist in patient management while awaiting transfer. Perhaps, by consultation with the trauma center, for example via telemedine, the transfer can be prioritized or even avoided.

Finally, the authors don't address the possibility that the population living in rural settings has accepted as a necessary trade-off for living in those settings, the fact that limited access to urban services will always be the case.
Response: We agree with Dr Lang, that there will always be less resources in rural centers compared to urban centers. Health care costs are increasing, perhaps beyond our capacity to pay. Rural citizens already have an “understanding” that they have to travel great distances to access a vast array of primary and “outpatient” tertiary care (like cancer care, dialysis, pediatrics, orthopedics, etc.).
The salient question remains, what sustainable level of resources can you provide these EDs with in order to offer safe, socially and ethically fair life or limb saving emergency care? Although rural citizens in Canada arguably share the tax burden required to pay for the health care system, they probably do not expect to have a neurosurgeon or cardiac surgeon in their backyard. But do they know they need to travel hundreds of kilometers for an emergency CT scanner, or basic surgical or obstetric emergencies? Moreover, is living rural really a choice? The utilization of our natural resources, a major economic force in Canada is rurally-based. Should we provide safe care for these workers, their families and visitors alike? Should we even study this issue and try to find creative solutions?

Reviewer Name Charles Branas
Institution and Country University of Pennsylvania, Philadelphia, USA
Please state any competing interests or state ‘None declared’: None declared.

In general, this is a well written paper of an important topic.

In abstract it would be advantageous to say that “…122(36%) were randomly selected and contacted…”

Response: The correction has been made in the manuscript.

In the abstract, “RST” is not defined.
Response: The correction has been made in the manuscript.

The descriptive study objective is laudable although more language could be added in fulfilling the goal stated in the Introduction: “…planning an intervention to address the causes of a lack of access to comprehensive health care in rural Canada.” Can you give us some idea(s) as to what this/these intervention(s) might be?
Response: This mention has been deleted.

The independent random selection procedure by a biostatistician is excellent.

Somewhere the Methods should state that the sample is a stratified random sample by province/territory – although the >=25% sample was met for every province/territory (according to Table 1), it might be good to state this in the Methods.
Response: The explanation that our objective was met is mentioned in the Results section.

It would have been better to use travel time calculations to Level 1 and 2 trauma centers, as opposed to distance calculations. Travel time is a much better metric of patient experience. The paper might mention this and explore this as a limitation of the paper, explaining how the results could have been different had travel time been used as opposed to road distance.
Response: We do not have actual interfacility transfer times to Level 1 and 2 trauma centers. Google map estimations do not consider emergency vehicle road and air transport. Moreover, actual transfer times include interval from initial request to referral center to arrival at trauma center. This would likely be underestimated by simple mapping estimations. We added this in the Limitations section.

Table 2 is of minimal value and the authors might consider removing it and perhaps putting some of the information in the text. The characteristics of the RSTs themselves may be very different than the larger catchment areas where the EDs/hospitals are located. This raises an important question- do Canadian hospital catchment areas/regions exist that could serve as units of analysis?
Response: We enquired about the possibility of reliably obtaining catchment area information. For example, what is the population served by your hospital? However, many rural hospitals did not know this information or if they did, the data/methodology varied significantly from sources for us to consider for this report.

Table 3 needs a better title and would be much enhanced with additional columns detailing the same information for nonrural hospitals to compare to.
Response: The title has been modified. The objective of the study concerned only rural hospitals. We don’t have data about nonrural hospitals. However, the comparison between rural and urban hospitals would be interesting.

Table 4 also would benefit from a more precise title.
Response: The title has been modified.